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ABSTRACT

Divided into two parts, this document provides guidelines for planning perfcrmance-based instruction. Part 1 deals with the general elements of instructional planning--those decisions which should be made before a lesson plan is written. The following five chapters are included in part 1: (1) Introduction to Instructional Planning: (2) Planning for the Teaching Content: (3) Planning for the Structure: (4) Planning for Student Experiences: and (5) Sequencing the Instruction. Part 2 provides infcrmation on developing lesson plans and is divided into the following chapters: (1) Fundamentals of Lesson Planning: and (2) Sample Lesson Plans. This guide is intended as a basic reference for teachers, as a resource text for use in inservice workshops, or as an instructional text that can be used with modules for individualized instruction. (BM)

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INSTRUCTIONAL PLANNING FOR PERFORMANCE-BASED INSTRUCTION IN VOCATIONAL EDUCATION

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FOREWORD

As a member of the Vocational-Technical Consortium of States (V-TECS), Alabama vocational education has access to the many research-based catalogs of occupational data. Those catalogs contain the basic, validated data for building current, performance-based programs: duty areas, tasks, performance objectives, criterion-referenced measures and performance guides. Occupational data from other sources are also available. But such data are the foundations for performance-based instruction, not the end product. For between the occupational data and the student is a wide gap. The bridge across that gap is the instruction itself, the actual lessons. Without them the occupational data are of little benefit to the students.

An effective performance-based lesson is not something that just happens; it is an event, an experience that must be carefully and systematically planned. This publication, therefore, deals with the planning of performance-based instruction. Part One deals with the general elements of instructional planning, those decisions which should be made before a lesson plan is written. Part Two deals more specifically with lesson plans.

Written to enhance the efforts in performance-based instruction in Alabama vocational education, this publication can serve these purposes:

- As a basic reference, it can help teachers who need review in the fundamentals of instructional planning.
- As a resource text, it can serve both facilitators and participants in in-service workshops.
- As an instructional text, it can be used with modules for individualized instruction.

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PART ONE -- ELEMENTS OF INSTRUCTIONAL PLANNING

Instructional planning is essentially a process of making decisions about teaching. Assuming that you have the performance objective toward which you must teach, there are some important decisions you must make before you put your teaching plan on paper. From your own knowledge and experience and the necessary research, you must make decisions to answer these questions:

- What skills and knowledges must be taught? In order to achieve the performance objective, the students must be able to DO certain things, and they must KNOW certain things about what they are doing. This requires that you decide on the teaching content those specific skills and knowledges which support the performance objective.

- What structure or framework will hold the content together to make it progressive and meaningful? The structure, in terms of student achievement, is the enroute or in-lesson objectives which support each performance objective. Called major steps or enabling objectives, such enroute achievement checkpoints will serve as definite steps toward reaching the performance objective.

- What experiences will best facilitate learning the skills and knowledges and meeting the objectives? Since performance-based instruction emphasizes student-centered instruction, you must decide on those methods and media which can meet the learning needs of the students.

- How will you organize the lesson? In order for the lesson to be effective, you must decide on the sequence for the teaching content and the learning experiences.

Those decisions which answer the above questions are the elements of instructional planning. Part One covers them in these chapters:

1. Introduction to Instructional Planning
2. Planning for the Teaching Content
3. Planning for the Structure
4. Planning for Student Experiences
5. Sequencing for Instruction

CHAPTER 1

INTRODUCTION TO INSTRUCTIONAL PLANNING

If one observes a skilled, effective teacher in operation, it is easy to assume that the teacher was "born to teach" and therefore does what comes naturally. For example, everything presented seems to fall into the right places. The teacher says and does the right things at the proper times. Questions and problems are dealt with as they arise. Students know what they are doing, and they do it well. The materials are available when needed and just seem to fit into place. Objectives are met, and the students seem motivated. In fact, one is likely to conclude, "That teacher has arrived. Teaching is a snap." But further consideration will often reveal that what was accomplished with such apparent ease was actually the result of some conscientious thought and hard work. That teacher who seems "born to teach" can PLAN a lesson as well as teach it. One of the keys to effective teaching is good planning.

As an introduction to instructional planning, this chapter summarizes the major purposes of planning, includes some basic assumptions which should be made before planning begins, and previews the major decisions which make up the planning process.

PURPOSES OF INSTRUCTIONAL PLANNING

The ultimate purpose of instructional planning is to design performance-based instruction which can bridge that gap between the student and the job. But more specifically, good planning enables the teacher in each lesson to:

- Teach toward specific outcomes.
- Contribute to student motivation.
- Conduct the lesson in an organized, orderly sequence.
- Ensure that all necessary skills and knowledges are taught.
- Make the best use of equipment and materials.
- Provide meaningful activities and experiences.
- Conduct performance-based evaluation of student achievement.

BASIC ASSUMPTIONS

Instructional planning must have a foundation in the course or program structure. Therefore, when the planning process begins, we must assume the following conditions:

- The course structure has already been determined. There should be a course outline or similar document which, among other things, identifies the approved content in terms of the units to be covered.

- The tasks or competencies to be developed should have been identified and reflected in the appropriate units of the course outline.

- Performance objectives should have been written or selected for each of the tasks or competencies.

If those conditions exist, the planning for instruction can begin. Otherwise, the course of study, curriculum guide or other documents must be developed before lessons can be planned.

PREVIEW OF PLANNING DECISIONS

A written lesson plan is a result of several decision-making processes. Part One deals with those decisions. In order to facilitate the use of Part One as a resource text, this section summarizes the decisions discussed in chapters 2 through 5. This will make it easier for those who use the text for reference to select specific chapters according to specific needs.

PLANNING FOR THE TEACHING CONTENT

Since the teacher must plan WHAT TO TEACH, it is necessary to determine those skills and knowledges which support the performance objective.

The skills and knowledges are the "meat on the bones" which make up the actual teaching content of each performance objective. They are the procedural steps which must be explained and demonstrated and the essential knowledges which must be presented.

Chapter 2 includes instructions on how to determine the supporting skills and knowledges for the teaching content.

PLANNING FOR THE STRUCTURE

In order for a lesson to include progressive steps toward achievement of the performance objective, it must have some structuring framework. Such structure is provided by planning and writing the enabling (in-lesson) objectives or major steps. These structuring objectives may be written for both skills and knowledges to serve as in-lesson checkpoints.

Whether written for skills or knowledges, enabling objectives provide the major checking points for assessing student achievement and progression.

Chapter 3 contains instructions on how to prepare enabling objectives or major steps for lesson structure.

PLANNING FOR STUDENT EXPERIENCES

In performance-based instruction, the students become active participants--they learn by doing, by becoming involved in meaningful, skill-developing activities. Such activities--reading, observing, listening, practicing, solving problems, completing projects, etc.,--must be carefully planned as appropriate for each lesson.

In order for those experiences to be most effective, the teacher must plan a format for them. The lesson format is the method or combination of methods for providing the information and facilitating the student learning experiences. The teacher, therefore, must decide and select from such methods as explanation/ discussion, demonstration/performance, directed study, laboratory assignments, individualized instruction, and other methods.

It is also necessary to select and plan for those media which can be used to transmit teaching information and support the learning experiences through application, practice and performance. Some examples of media to be selected are printed materials such as textbooks, manuals, handouts, information sheets and task sheets; graphic materials such as charts, diagrams, schematics and photographs; audiovisuals such as films, tapes, TV videotapes, filmstrips, slides and transparencies; and actual objects such as tools, supplies, and equipment.

Chapter 4 presents guidelines for the selection of all such student experiences, including both methods and media.

SEQUENCING THE INSTRUCTION

An effective lesson must be presented in a progressive, orderly sequence so that each step properly relates to the other steps and contributes to achievement of the objective. Chapter 5 presents basic approaches to sequencing and some guidelines on how to use them.

CHAPTER 2

PLANNING FOR THE TEACHING CONTENT

One of the major decisions to be made when planning a lesson is the content of the lesson in terms of specific skills and knowledges. Chapter 2 deals with how to determine those skills and knowledges for teaching content.

DETERMINING THE SKILLS OR PROCEDURAL STEPS

A convenient and practical method for planning the skills to be taught is to analyze the performance objective and determine the procedural steps for doing it. Such procedural steps, when determined, serve these important functions:

- They provide the basic framework for the teacher's explanations and demonstrations. When organized in the teacher's lesson plan, they may be accompanied by the necessary teaching points for complete explanation (why it must be done a certain way, how-to-do-it explanation, what happens when not properly done, etc.).

- They help to establish the sequence for the instruction.

- They become the basis for student practice and performance.

- They become the basis for writing job sheets, task sheets, assignment sheets and other items of student materials used as media in support of the lesson.

SOURCES FOR PROCEDURAL STEPS

Basically, there are two sources from which you can derive the procedural steps, a completed task analysis and a task breakdown.

COMPLETED TASK ANALYSIS. If a task analysis has been completed in detail, the procedural steps will be listed under each major step or task element.

TASK BREAKDOWN. If a task analysis contains only a listing of the major elements, then you should break each element down into its specific procedural steps. Here is an example of how each element in a task can be broken down into its procedural steps.

TASK: Prepare checks for payment

PERFORMANCE OBJECTIVE: Provided a blank check for student use and information concerning date, payee, drawer, amount, previous deposits and balance, and checkwriting guidelines, prepare the check and stub without error.

ELEMENTS:

Analysis of this task results in two distinct elements or subtasks:

1. Fill in check stub

2. Write the check

PROCEDURAL STEPS:

The specific, how-to-do-it procedural steps for each of those elements are as follows:

1. Fill in check stub.

    a. Make sure balance is up-to-date.
    b. Record deposit.
    c. Total previous balance.
    d. Record amount of check.
    e. Subtract and record new balance.
    f. Record balance on next check stub.

2. Write the check.

    a. Write check number if not prenumbered.
    b. Write date on which check is being issued.
    c. Write the payee's name in full.
    d. Write amount of check in figures.
    e. Write amount in words
        (1) Begin at extreme left
        (2) Separate dollars and cents with word "and"
        (3) Write cents as fraction of 100
        (4) Draw line from cents to "Dollars"
        (5) For amount less than $1, write "only - cents"

Here is another example to illustrate how a task has been broken down into its procedural steps:

TASK: Clean, gap, and test spark plugs

PERFORMANCE OBJECTIVE:

Given an automobile needing spark plug service and access to the appropriate tools, equipment, and service manual, clean, gap, and test the spark plugs, and place them into the engine according to the manufacturer's specifications and procedures.

1. Remove spark plugs.
    a. Remove spark plug wires.
    b. Loosen spark plug.
    c. Clean area around plug.
    d. Remove spark plug from head.
    e. Remove gasket.

2. Clean spark plug.
   a. Use cleaning machine.
   b. Clean with compressed air.
   c. Clean with file.
   d. Clean with wire brush.

3. Set spark plug gap.
   a. Look up spark plug gap in manual.
   b. Use gauge to check gap.
   c. Bend ground electrode to open or close gap.

4. Test spark plugs.
   a. Use testing machine.
   b. Determine efficiency.

5. Install spark plugs.
   a. Coat threads with engine oil.
   b. Install in head.
   c. Torque to specification.
   d. Replace plug wires in proper order.

The following are some recommended procedures for doing a task breakdown.

- Self-knowledge and experience. The best place to start is with your own knowledge of how each element is performed. Write the procedural steps under each element in the correct performance sequence.

- References. You should never rely entirely on your own knowledge of how an element is performed. Instead, you should consult the most current, reliable sources available such as manuals, textbooks, and handbooks.

- Interviews. This third procedure serves sometimes as a primary source and is also useful to validate or revise a breakdown derived by one or both of the previous procedures. Go to other instructors, supervisors or workers, and obtain information on both the content and sequence of each element breakdown.

DETERMINING RELATED KNOWLEDGES

For many tasks, there are certain important knowledges which must be taught in addition to the explanations and demonstrations of task procedures. They are referred to as related knowledges because they relate to and support the performance objective. Some examples are terminology, safety precautions, reasons for doing a task, essential theory of operation and nomenclature of equipment.

GENERAL GUIDELINES FOR SELECTING RELATED KNOWLEDGES

Here are some specific guidelines to help you decide which knowledges ARE essential.

- The knowledge is essential to safety. This includes safety precautions pertaining to the student, precautions necessary to prevent damage to the equipment, and precautions necessary to safety or well-being of the patron or customer.

- The knowledge is necessary to prepare the student for job decisions or contingencies. For example, in cosmetology, it is necessary for students to know which type of shampoo to use for each hair condition.

- The knowledge is necessary to orient the student to the task. Some examples of this would be why a task is performed and the different conditions under which it might be required.

- It is necessary to teach some theory or operating principle prior to the task performance.

SOURCES FOR RELATED KNOWLEDGES

The common sources for deriving outlines of related knowledges are as follows:

- Self-knowledges or experience. Since you already have a background in the subject matter with which you are working, you can proceed with a tentative analysis. Remember: Do not be satisfied with your own analysis; you should confirm and revise it based on information from other sources.

- Research. If you have made a tentative analysis based on your own background, research may be the next source. You can refer to current printed data such as manuals, textbooks, and other printed sources.

- Subject matter specialist review. If you are not satisfied with the related knowledges you have determined from your own experiences and research, you may consult other experts for review and necessary corrections. Use other instructors, supervisors and workers as your subject-matter specialist.

EXAMPLES OF RELATED KNOWLEDGES

The following are examples to show how related knowledges have been selected to SUPPORT the respective objectives.

TASK: Prepare checks for payment

PERFORMANCE OBJECTIVE:

Provided a blank check for student use and information concerning date, payee, drawer, amount, previous deposits and balance, and checkwriting guidelines, prepare the check and stub without error.

RELATED KNOWLEDGES

1. Terms pertaining to checks
   a. Check - written order from depositor directing bank to pay specific sum of money to one named on check
   b. Cash - coins, paper money, checks, money order and money deposited in bank.
   c. Currency - paper money
   d. Signature card - card filed by bank to show who is authorized to sign check for the account
   e. Depositor - one in whose name money is placed in the bank
   f. Drawer - the depositor

g. Drawee - the bank
h. Payee - the one who receives the check

2. Parts of a check
   a. The stub or source document
      (1) Check number and amount
      (2) Date
      (3) Payee
      (4) Reason for payment
      (5) Balance brought forward
      (6) Deposits
      (7) Total
      (8) Balance less check

   b. The check
      (1) Check number
      (2) Date
      (3) Payee
      (4) Figure amount
      (5) Written amount
      (6) Drawee
      (7) Drawer
      (8) Signature
      (9) ABA numbers
     (10) Magnetic ink character

TASK: Clean, gap, and test spark plugs

PERFORMANCE OBJECTIVE:

Given an automobile needing spark plug service, and access to the appropriate tools, equipment, and service manual, clean and gap the spark plugs, and place them back into the automobile according to the manufacturer's specifications and procedures.

RELATED KNOWLEDGES

1. Spark plug composition
   (a) Procelain
      (1) Insulation
      (2) Heat dissipation
   (b) Steel
      (1) Center part
      (2) Base
2. Spark plug components
   (a) Terminal
   (b) Seal
   (c) Insulator
   (d) Rib
   (e) Flats for wrench
   (f) Seal
   (g) Shell
   (h) Gasket seal

(i) Center electrode
(j) Threads
(k) Side electrode
(l) Gap

3. Spark plug conditions
   (a) Oil fouling
   (b) Gas fouling
   (c) Burned or overheating
   (d) Normal conditions
   (e) Carbon fouling
   (f) Silicone deposit
   (g) Splashed fouling

CHAPTER 3

PLANNING FOR THE STRUCTURE

Since performance-based instruction is progressive in nature, each lesson should have some interim achievement or checkpoints. Such checkpoints within the lesson are referred to as enabling objectives. Chapter 3, therefore, explains how to plan and write them. It deals with two kinds of enabling objectives for task elements and two kinds for related knowledges.

ABBREVIATED ENABLING OBJECTIVES FOR TASK ELEMENTS (MAJOR STEPS)

One form of enabling objective which is widely used is an action statement of the task element or major step. We refer to this as abbreviated because only the behavior is stated. Each task (and performance objective) is usually divisible into two or more major steps which, when performed in sequence, make up the total behavior of the performance objective. For example, the task, "Give plain shampoo" may be divided into these major steps or abbreviated objectives:

Make preparation for shampoo.

Prepare the patron for shampoo.

Give first application of shampoo.

Give second application of shampoo.

Partially towel dry the hair.

Another task, "Bend copper tubing with spring bender" could be divided into these major steps:

Prepare the tube for bending.

Bend the tubing.

PURPOSES OF MAJOR STEPS

When properly stated as action statements, major steps become the enroute or enabling objectives. As such they serve these purposes.

- They establish major checkpoints for the lesson. As they reach each major step, students can practice and perform before progressing to the next step. The teacher can evaluate performance to determine those who have mastered the step and those who need extra practice or remedial instruction. When such a system of interim checkpoints is applied, the teacher can expect students to achieve the performance objectives without unreasonable difficulty because they have mastered the steps one at a time.

- They provide the basis and structure for specific activities. Since the lesson pertaining to an entire task might require several hours, it might be desirable to build an activity around the mastery of a task element. In that way, both teachers and students have a long-range objective (achievement of a task performance objective) and short-term objectives (major steps or enabling objectives).

CRITERIA FOR SELECTING MAJOR STEPS

The following guidelines will help you decide which components from a task analysis or breakdown qualify as major steps.

- A major step is a meaningful activity, meaningful in the sense that it is a complete task element which contributes to performance of the entire task. The previous example, "Prepare customer for shampoo" is a meaningful activity because it represents a complete element of the task "Give plain shampoo." But "Remove pins from hair" by itself is not a meaningful activity; it is merely a procedural step.

- A major step is made up of a sequence of procedural steps. The previous example, "Prepare patron for shampoo" qualifies as a major step because it can be broken down into more specific steps usually done in sequence such as this example.

  Greet and seat the patron.

  Ask patron to remove neck or ear jewelry and glasses.

  Drape the patron.

  Remove all hair pins from hair.

  Examine condition of hair and scalp.

- It represents a major checkpoint in progression toward the next step. Since a major step is a meaningful activity made up of procedural steps, it can be learned, practiced and mastered by the students. Upon mastery, the students will be ready to move on to the next step.

- It can usually be explained and demonstrated as a meaningful entity. As explained previously, a major step often becomes the basis for a major part of the lesson. When evaluating a major step according to this guideline, it is helpful to ask "Could I build a meaningful activity upon this step?"

- It can be practiced and evaluated in a meaningful setting. If a step does not lend itself to such meaningful practice and evaluation, you should question whether it is merely a procedural skill instead of a major step.

GUIDELINES FOR WRITING AND EDITING MAJOR STEP STATEMENTS

Major steps should be written as complete action statements. Here are some guidelines for writing and editing them.

RULE 1: USE ACTION VERBS TO CLEARLY SPECIFY OVERT, OBSERVABLE BEHAVIOR. A simple way for doing this is to imagine that one is telling the students to do the major step. If, for example, the teacher has explained and demonstrated how to prepare

the patron for a shampoo, she (he) would not tell the students, "Be able to prepare a patron for a shampoo," or "Know how to prepare a patron for a shampoo." Instead she (he) should simply direct them to "Prepare the patron for a shampoo."

RULE 2: QUALIFY THE STATEMENT BY INCLUDING THE OBJECT. The action verb answers the question, "Do what?" The object answers the question, "To what or whom?" Consider these examples:

Action Verbs (Do What?)	Objects (To What or Whom)
Bend	copper tubing
Prepare	patron
Change	tire
Replace	fuses

RULE 3: (When applicable)) IT IS SOMETIMES NECESSARY TO WRITE A STATEMENT WHICH NOT ONLY ANSWERS THE TWO PREVIOUS QUESTIONS BUT WHICH ALSO ANSWERS A THIRD: "TO WHAT EXTENT OR FOR WHAT PURPOSE." Consider the following examples:

Action Verb (Do What?)	Object (To what or whom)	Qualifier (For what purpose, to what extent, etc.)
Prepare	patron	for shampoo
Bend	copper tubing	to 45^{0} angle
Troubleshoot	circuit	to isolate malfunctions
Inspect	ignition system	for broken wires

ADDITIONAL EXAMPLE OF MAJOR STEPS

TASK: Clean, gap, and test spark plugs

PERFORMANCE OBJECTIVE:

Given an automobile needing spark plug service and access to the appropriate tools, equipment, and service manual, clean and gap the spark plugs, and place them back into the authomobile according to the manufacturer's specifications and procedures.

MAJOR STEPS (Derived from analysis of task)

1. Remove spark plugs
2. Clean spark plugs
3. Set spark plug gaps
4. Test spark plugs for efficiency
5. Install spark plugs

THREE-COMPONENT ENABLING OBJECTIVES FOR TASK ELEMENTS

While many teachers prefer the abbreviated form of enabling objectives or major steps, others prefer them written in complete behavioral terms with the three components of behavior, standards and conditions. This section, therefore, deals with them. Since the concept is the same as for task performance objectives, this section does not deal in detail with their components. (For more detailed information on the components, refer to the text, DEVELOPING PERFORMANCE OBJECTIVES AND CRITERION-REFERENCED MEASURES.*) Instead it presents some of the advantages over the abbreviated form and summarizes the three components.

ADVANTAGES

When compared with the abbreviated enabling objectives, those written in complete behavioral terms have the following possible advantages:

- They provide more complete guidance for designing the checkpoint measures for them. Because the conditions and standards are written, the teacher will know exactly how to administer the measures and how to evaluate them. This is especially true of difficult or complex task elements.

- They specify more control over the performance and evaluation. Again, this is especially true if the task element is difficult or complicated.

- When used as the basis for lessons, they provide complete behavioral objectives rather than just the statement of major steps.

- They help teachers to be consistent in describing desired student behavior changes. This is true because they contain both the conditions and standards.

WRITING THREE-COMPONENT ENABLING OBJECTIVES

In writing enabling objectives in this form it is necessary to specify these components:

CONDITIONS. This component usually specifies what the student will use in performing each element. When the equipment and supplies (and other conditions) are clearly implied, it is not always necessary to write them in.

BEHAVIOR. This component is the complete action statement of the behavior. Like the abbreviated enabling objectives for a major step, it must answer the questions "Do what to what or whom?" and sometimes "For what purpose or to what extent?"

STANDARDS. How well the students must perform is specified in this component. A clearly specified standard will enable the teacher to make an accurate, objective evaluation of the students' performance. Some common types of standards are:

*This text is available from the Curriculum Development Unit, Division of Instructional Services, Room 802, State Office Building, Montgomery, Alabama 36130

- Degree of accuracy such as ". . .within plus or minus 5°."
- Time limits such as ". . .within five minutes."
- Content of finished product such as ". . .plan must include the following elements:"
- Quality of finished product such as ". . .with smooth, even stitches."

EXAMPLES OF THREE-COMPONENT ENABLING OBJECTIVES FOR TASK ELEMENTS

TASK: Prepare checks for payment

PERFORMANCE OBJECTIVE:

Provided a blank check for student use and information concerning date, payee, drawee, amount, previous deposits and balance, and check-writing guidelines, prepare the check and stub without error.

ENABLING OBJECTIVES:

1. Given information on required check payment and a blank check stub, fill in the stub without error.

2. Provided information on payment by check and sample check, write the check without error.

TASK: Put on and remove sterile gloves

PERFORMANCE OBJECTIVE:

Given a pack of sterile gloves, put the gloves on and remove them without breaking sterile technique.

ENABLING OBJECTIVES:

1. Given a pack of sterile gloves, put the gloves on without breaking sterile technique.

2. Having put on a pair of sterile gloves, remove the gloves without contaminating the skin.

TASK: Take cuttings

PERFORMANCE OBJECTIVE:

Given stock plants to use for taking cuttings, necessary equipment and supplies, take cuttings. Satisfactory completion is realized when the following criteria are met: (1) Cuttings are taken from current terminal wood, and (2) The cut is made on a 45 degree angle.

1. Given stock plants, the necessary equipment and supplies, select the proper wood to cut. (Must select current terminal wood.)

2. Given stems selected in previous activity, necessary equipment and supplies, take cuttings at 45° angles.

WRITING ENABLING OBJECTIVES FOR RELATED KNOWLEDGES

Whenever you are to teach related knowledges, you should have enabling objectives if you wish to have activities and checkpoints in the lesson for them. This section deals with how to write them. It includes some guidelines on the levels of knowledge and some directions for writing both the abbreviated and three-component enabling objectives.

DETERMINING LEVELS FOR RELATED KNOWLEDGES

Before attempting to write an enabling objective for any segment of related knowledge, you should identify the level to which it needs to be taught. The term level refers to what students are expected to do with the knowledge. For example, in teaching the terms pertaining to checks, the teacher would probably want the students to remember, recall, in other words, "know" the terms. On the other hand, if he or she were teaching the rules for long division that teacher would probably want the students not only to remember those rules but also to use them to solve problems.

Generally, there are six levels to which related knowledges may be taught and applied. They are presented here from the simplest to the most complex.

KNOWLEDGE. The lowest level has to do with recalling or remembering information. Some examples of this behavior are memorizing a set of rules, naming the parts of something, identifying correct answers from lists, matching columns, etc. This level applies when all that is required is for the students to remember or recall certain information.

COMPREHENSION. Once the students have developed the ability to remember or recall the required information, it is possible to go to the next higher level, comprehension. This level means that they not only can recall facts but can also understand relationships. One measure of comprehension is translation, that is, taking information learned in one form and stating it in another. A common example of this is the traditional essay question in which the student is directed to "Explain in your own words..." More practical examples are reading the data from a graph or chart and expressing it verbally, putting verbal data into a chart or graph, and writing the description of a house from a blueprint.

APPLICATION. The next higher level is application which means that students not only remember the facts and understand the essential relationship but can also use that information or transfer it to other situations. Here are some examples. The students apply the Ohm's Law formula by computing unknown current, resistance, and voltage. The students apply the rules of safety by writing a safety checklist. The students apply the formula for compound interest by solving compound interest problems.

ANALYSIS. Basically, at this level the students can take the whole and break it down into its component parts based upon the relationships which they have learned. For example, the students analyze a job application form and show its parts, make an outline of a technical description, trace the flow of electricity through the major components, or take a narrative problem and set it up in mathematical form.

SYNTHESIS. Whereas in analysis the students break down a whole into its related component parts, in this level they take the component parts to put together a new whole. Some examples are drawing a floor plan for a house, drawing a schematic to represent the components of a system, or using data and information to write a job resume.

EVALUATION. The highest form of cognitive behavior and one which is used less than the others in entry level training is evaluation. This means using criteria to make a value judgment on a process or a product. Some examples are editing a resume, inspecting a blueprint, critiquing a performance, or judging a skills contest.

WRITING ABBREVIATED ENABLING OBJECTIVES FOR KNOWLEDGES

As in the abbreviated enabling objectives for task elements, this type is also a concise statement of the desired behavior when written for knowledges. Once you have identified the level to which the knowledge should be used, write a statement which expresses what you want the student to DO to prove he or she has learned it. Consider these wrong and right examples.

WRONG	RIGHT
Know compound interest.	Solve compound interest problems.
Apply Ohm's Law.	Compute resistance, voltage and current, using Ohm's Law.
Identify bones of upper extremities.	Label bones on a drawing of the upper extremities.
Understand the following terms.	Define the following terms.

The following examples will help you write abbreviated enabling objectives to match the levels of use you have determined.

1.	Knowledge	LABEL bones on a diagram.
		LIST the five parts of the . . . .
		MATCH each term with the correct definition.
		UNDERLINE the key words in the following passage from a manual.
		OUTLINE the steps for . . . .
		CHECK the true statements.
2.	Comprehension	DESCRIBE the house represented on the blueprint.
		SUMMARIZE the letter of application.
		PLOT the following information on a graph.
		WRITE two examples for each of the following:
		EXPLAIN in writing two causes of . . .
3.	Application	CHANGE the decimals to fractions.
		CONVERT the following to metrics.

		DRAW a floor plan for the following specifications.
		COMPUTE the feed rations for . . .
		WRITE examples of how these principles can be applied.
4.	Analysis	BREAK down this job into its steps.
		MAKE a flow chart to show the major work activities in this description.
		DRAW a diagram to show each of the cell components.
		ANALYZE a schematic drawing to identify the main system components.
5.	Synthesis	COMPILE a bibliography for shop use.
		WRITE a work report, using these facts.
		DEVELOP a work plan.
		DESIGN a new form to record this information.
		CREATE a new dress pattern.
		PLAN a new schedule.
		PREPARE a speech about your job.
6.	Evaluation	RATE a worker according to these standards.
		EXPLAIN why this application is acceptable or unacceptable.
		JUSTIFY this request for new tools.
		WRITE a critique on a field trip.
		EDIT an information sheet for readability.

WRITING THREE-COMPONENT ENABLING OBJECTIVES FOR RELATED KNOWLEDGES

The first component, the statement of vehavior, may be determined and written as explained in the previous section. The conditions and standards can then be added.

WRITING CONDITIONS. Having written the behavior statement to desired knowledge levels, you should also determine the instructional conditions under which those behaviors can occur. For example, if the behavior is to "Label the components of a carburetor on a diagram," a required condition is an unlabeled diagram. In some cases, conditions will be so clearly understood that it is not necessary to write them out.

WRITING STANDARDS. If knowledge-type enabling objectives are to be formally evaluated, it is necessary to provide the standards for minimum acceptable performance. Different types of standards may be used depending upon behaviors and conditions. One of the most common types of standards is the degree of accuracy or correctness as shown in the following examples:

Label at least 195 of the 206 bones correctly.

Solve at least 8 of 10 problems correctly.

Match at least 15 of 20 definitions correctly.

Underline at least 90% of the tools correctly.

However, when enabling objectives are in the higher levels of cognitive behavior (analysis, synthesis, evaluation) standards are often based on the content or quality of a finished product. For example:

Job breakdown must include all procedural steps.

Work plan must include each of the following elements.

The floor plan must be scaled to exact specifications.

SAMPLE THREE-COMPONENT ENABLING OBJECTIVES FOR RELATED KNOWLEDGES

The following are some enabling objectives containing the three components. When written in this manner, they provide descriptions of the activities which can be planned as in-lesson checkpoints.

Given an unlabeled drawing of the human skeleton, label at least 195 of the 206 bones correctly.

Given data on daily sales for a month, plot the sales on a graph to the nearest $100 for each day.

Given a list of weights and measures of the English system, convert each to the nearest metric system equivalent.

Given a tape recording of a job interview, write a critique on the interview, using the attached checklist.

CHAPTER 4

PLANNING FOR STUDENT EXPERIENCES

A performance-based lesson in operation is a carefully planned arrangement of learning experiences which lead up to achievement of the objective. Learning experiences include the methods used to facilitate them and the media used to support the methods. This chapter deals with how to plan for learning experiences. It includes:

Methods for Facilitating Learning Experiences

Media for Facilitating Learning

Guidelines for Planning Methods and Media

METHODS FOR FACILITATING LEARNING EXPERIENCES

The teacher must have a planned system for directing and controlling those experiences through which students learn. There must be a pattern or format for presenting the related knowledges, introducing equipment and supplies, explaining and showing how procedures are performed, and directing practice and performance. A method, then, sets up the general format for those activities. A good lesson is usually a combination of methods carefully selected to facilitate learning experiences.

It is convenient to think of student experiences in terms of how students learn and what they learn. Students must learn knowledges (facts, principles, relationships, etc.), and there are methods suited to that requirement. They also learn by observing; some methods are suited to observation. They need other experiences in which they learn by doing, and there are methods which facilitate that kind of experiences. From time to time, there should also be experiences planned to reinforce learning. Accordingly, the methods in this section are grouped according to those learning requirements.

METHODS THROUGH WHICH STUDENTS LEARN INFORMATION

Included in this group are lecture, discussion, audiovisual programs, guest speakers, programmed instructional materials, and directed study assignments.

LECTURE. One of the ways for the teacher to transmit facts, concepts, rules, principles and relationship is by the lecture method. In this method, the teacher explains, tells, informs, and often uses such aids as chalkboard, transparencies, or slides. In vocational education, an informal lecture presentation is often used as a part of the lesson.

The informal lecture has several uses, among them the following:

- Introduce the course, a block or a unit
- Present the related knowledges of a lesson
- Summarize a problem or assignment

- Provide information which is difficult for students to otherwise obtain
- Provide information to large groups

DISCUSSION. This is a teacher-conducted approach in which students learn by sharing information and experiences. It often follows a lecture presentation or outside study assignments. In this method, the teacher uses questions designed to cause students to participate by exchanging ideas, opinions and experiences to reach conclusions that support the lesson objectives. The teacher's job is to ask questions, pose problems, and direct student participation. Students answer questions by pooling their thinking under the teacher's guidance to bring out the desired information.

Some of the main purposes served by the discussion are as follows:

- Stimulate effective thinking
- Promote student participation
- Promote meaningful expression
- Correct misconceptions
- Supplement other methods

AUDIOVISUAL PROGRAMS. When available, audiovisual programs can be very useful in transmitting information to students. Some examples are films, tape-slide programs, tape-filmstrip programs, and TV video tapes. They are often accompanied by exercises and other devices which enhance student participation.

Some of the uses of audiovisual programs are:

- Provide a professional presentation
- Appeal to senses of hearing and seeing
- Provide standardized coverage
- Illustrate difficult concepts
- Offer variety when used along with other methods
- Enhance interest and motivation

GUEST SPEAKERS. Often a local expert is available to speak to the class on a specific topic related to the course. This is inexpensive (usually the speaker does this as a goodwill or public relations effort), and it can be highly informative. Some of the purposes best served by this method are as follows:

- Provide current job and career information
- Provide information on new techniques and procedures

- Provide motivational type information

PROGRAMMED INSTRUCTIONAL MATERIALS. Programmed texts and other programmed instructional materials may be used to teach necessary knowledges such as math, metric system, principles, and procedures. In this type of technique, the information is presented in small steps. After each step, the student is asked to respond by answering questions or completing other types of exercises. After each response, the correct answers are given so that the student is reinforced. Thus, the student learns information through repetition, application, and reinforcement. Whenever such materials are available, they are usually very effective.

Programmed instructional materials can be used to:

- Teach recall and memorization
- Teach the transfer of principles and rules
- Teach sequential mental processes such as working long division
- Teach relationships

DIRECTED STUDY ASSIGNMENTS. If the students are capable of reading and understanding information, it is sometimes possible to make directed study assignments from textbooks, information sheets, and other sources. This type of assignment is often accompanied by exercises or questions to reinforce the study.

Directed study assignments can be used to:

- Introduce new material
- Provide the background for a later discussion period
- Offer catch-up opportunity to students who were absent when the material was taught by other methods

METHODS THROUGH WHICH STUDENTS LEARN BY OBSERVATION

Sometimes it is necessary for students to learn through observation–watching something being done or observing the parts and components of a particular item of equipment. Included in this group are live demonstrations, audiovisual demonstrations, field trips, displays, and illustrations.

LIVE DEMONSTRATION. Those objectives dealing with HOW TO DO something are best approached through the demonstration. Although a demonstration usually includes explanation (show and tell), its basis is observation. The demonstration method is a planned performance by an instructor of a physical or motor skill, principle, or experiment. A demonstration might be as simple as showing a class how to hold and use a pair of scissors, or it might be a more complicated skill such as soldering an electrical wire splice. Simply stated, the demonstration is a method by which the teacher shows the students HOW certain things are done.

Because of the show and tell approach of the demonstration method, it offers these advantages:

- It can make explanations concrete by showing what is explained.
- It appeals to both sight and hearing.
- A demonstration can exemplify the quality of performance expected of the students.
- A correctly performed demonstration will reduce student performance errors.
- The demonstration method is very effective in identifying the precise steps and fixing the exact sequence.
- It can illustrate how to follow safety precautions.

AUDIOVISUAL DEMONSTRATIONS. The demonstration of a procedure may be presented by a film or video tape if available. Serving the same purposes as the live demonstration, they offer these additional advantages.

- They can provide close-up views of small objects which are difficult to see in a live demonstration.
- They can show procedures in slow motion when necessary.
- They can be filmed so that each viewer seems to be "looking over the shoulder" of the performer.
- They can be used over and over as a standard presentation.

FIELD TRIPS. If the opportunities exist and it is convenient to do so, field trips can offer valuable first-hand observation of what it is actually like in the factory, in the shop, or in the business environment. Designed to give students direct experience with their chosen skill area, field trips may be used with either large or small groups.

Field trips may be used to:

- Provide realistic observation.
- Expose students to the real world of work.
- Provide experiences to aid in making career choices.

DISPLAYS. This method of providing for observation is sometimes called an exhibit. It may inlcude such items as actual equipment, models, mockups, graphic materials, bulletin boards, chalkboards, projected still images (transparencies, slides) and dioramas.

The display method can be effective in providing opportunity for observation when:

- No motion is required--there is no immediate need to see the items in use.

- There is a need for general visual orientation (what something looks like, general layout, etc.).

- It is necessary to show general visual relationships (components, where each item fits in, etc.).

ILLUSTRATIONS. A series of printed or photographed illustrations can be used effectively when it is impossible or impractical to show the actual equipment or procedure. Although this method is seldom used alone, it can be useful when:

- It is more practical to begin with a series of illustrations to be followed later with more real life exposure.

- Illustrations can be used to preview a field trip or give general orientation to a procedure.

METHODS WHICH FACILITATE LEARNING BY DOING

One of the most important learning experiences in performance-based instruction is that of learning by doing. Included in this category are conventional directed performance, group work, laboratory assignments, experiments, projects, role playing, and simulation games.

DIRECTED PERFORMANCE. The directed performance method is a controlled experience which provides students with the opportunity to practice, perform, and apply under controlled conditions and close supervision. It is more student-centered and results in a higher level of student participation and involvement than any other method. Three important advantages of this method are as follows:

- It enables students to learn skills through practice. The instructor may conduct an evaluation when the student has had sufficient practice.

- It permits reinforcement. Knowledge acquired through a lecture can be made more meaningful through a demonstration, but the highest level of understanding is achieved and reinforced when the student gains personal experience through actual performance.

- It provides for individual guidance and evaluation. Under the supervision of the teacher, the student can practice until both are confident that the formal evaluation of the performance objective can be passed.

GROUP WORK. This is a method of organized performance in which one group practices on tasks or completes a project/exercise while other groups complete different assignments. The teacher serves as coordinator and leader. Groups should be rotated until all have accomplished the same procedures. Group work is effective and desirable when:

- The activities are conducive to group performance (building a display, building a small building or other items, etc.).

- It is necessary to rotate performances because of limited equipment and supplies.

- Each group has been properly prepared with necessary explanations and demonstrations of procedures.

LABORATORY ASSIGNMENTS. Available in many programs is a sequence of simulated job performances in a laboratory work environment. Some examples are welding and machine shop in which students can learn to weld certain beads or cut certain tools or other items. Such assignments are usually accompanied by job sheets which give the specifications and requirements and provide general directions. Laboratory assignments offer the same advantages as directed performance. In addition, they are usually more controlled and more precise in terms of student skills to be developed.

EXPERIMENTS. This type of performance is a planned procedure under controlled variation of conditions. When the experiment has been completed and the results observed, the students discuss principles and relationships. Although not as widely used as some of the other methods, the experiment method enables students to observe first hand the application of principles.

PROJECTS. One of the most effective ways of providing meaningful practice is the use of projects. Selected to match the students' interests and to require the same procedures, conditions, and standards of the performance objectives, projects involve the student with the pride of accomplishment and ownership. Some of the numerous examples include making a dress, making a desk, typing a personal letter, repairing one's television set. Projects may also--and quite often--involve groups and are done for student organizations, the school, and the community. When carefully chosen according to the objectives, projects add a high degree of realism to learning by doing.

ROLE PLAYING. Many of the skills in such areas as communication skills and human relations can be learned through role playing. Some examples are telephone techniques, interviews, and worker-supervisor relations. Usually each person is given instructions on how to play the role. Some of the uses of this method are as follows:

- Each player can experience the role of someone else.

- The student can experience some of the feelings of a situation.

- The class can learn through observation and critique.

SIMULATION GAMES. This method is a model of a real situation with roles to be played, rules to be followed, and a method of determining a winner. Some examples are model offices, banks, stores, and hospitals. The "games" are designed to require application of the skills and knowledges required in the objective(s). When carefully selected and used to support objectives, simulation games provide practice in coping with different circumstances and teach social interaction and decision. Many of the major publishers of instructional materials now offer simulation games packages.

METHODS FOR FACILITATING REINFORCEMENT

Although some reinforcement should be inherent in all methods, there are some methods which are especially suited to reinforcement. Usually applied after one or more of the previous methods, they include the post-performance drill sessions or assignments.

POST-PERFORMANCE CRITIQUE. When students have performed a procedure, completed an assignment, or done a project, they have a need for reinforcement--they need to know how well they have done. For that reason, a critique after performance is important. A good critique, whether given individually or to the class, should include these elements in this order:

- Emphasize the positive aspects--correct performance, acceptable product, correct answers, results obtained.
- Cover areas which can be improved rather than reprimand because of mistakes.
- Make specific suggestions for improvement.

The post-performance critique can be used after most types of activities in which students have been learning by doing.

REVIEW. This is usually an organized summary which covers all of the key points of the lesson or a part of it. It may be presented orally by the teacher or it may be given out as a handout or study directions. Its main purpose is to reinforce learning through planned repetition. Review is sometimes accomplished by a set of questions to be answered in an inclass or homework assignment.

SUMMARY. Although similar to the review, the summary is a more general wrap-up of the lesson or parts of it. Usually the summary covers the main points or major steps and reinforces the students' recall of the lesson's major structure, objectives, and achievements. It attempts to reinforce achievement with a recap of what was earlier given in the preview. For example in the preview the teacher says, "I'm going to explain these four parts." In the summary, the teacher says "These are the four parts I have explained."

QUESTIONS AND ANSWERS. Sometimes it is convenient, often after a presentation of information, to devote a few minutes to questions and answers. This may include questions generated by the students and questions prepared and asked by the teacher. This method is a good way to clear up misconceptions and misunderstandings.

DRILL. This method, not as widely used as the others, involves the repetition of concepts, words, mathematical formulas, and so forth until they are memorized. This method can work with large groups, small groups, or individuals. The drill may be verbal or written.

MEDIA FOR FACILITATING LEARNING

When the methods for facilitating the learning experiences have been selected, the media must be selected to support them. Media includes all items used to transmit information, clarify concepts, assist in practice and performance and provide reinforcement. For our purposes, we shall consider media in these categories:

Audiovisuals, Motion

Visuals, Projected

Sound Recordings

Visuals, Non-projected

Models and Objects

Written Materials

We shall itemize the media in each category and present the main advantages.

AUDIOVISUALS, MOTION

Included in this category are motion pictures and television.

MOTION PICTURES. 8 mm and 16 mm films.

- Provide visual concepts that are difficult or impossible to attain in a classroom situation.
- Offer slow motion, stop action, speeded-up motion and animation.

TELEVISION

- Provides realistic learning experiences--students have a sense of being there, see how it is done over the shoulder.
- Can be used individually, with small groups or with large groups.
- Can use audiovisual materials not normally available to the classroom teacher.
- Videotapes can be reshown as many times as necessary.

VISUAL, PROJECTED

This category includes transparencies for overhead projection, filmstrips and slides, and opaque projections.

TRANSPARENCIES FOR OVERHEAD PROJECTION

- Projector can be operated from the front of the room.
- It is not necessary to darken the room.
- It is possible to illustrate one step at the time and end up with a complete projection by using overlays.
- Transparencies are relatively easy to prepare and inexpensive to make.

FILMSTRIPS AND SLIDES

- Provide color.
- Are relatively easy to make and inexpensive to purchase.

- Require only a moderately darkened room.
- Can be used with recordings to make a complete instructional package.

OPAQUE PROJECTIONS. Although the opaque projector is no longer widely used, it can be highly effective when there is a need to:

- Project nontransparent materials such as books, flat pictures, objects, and specimens.
- Make use of existing material for group instruction without making slides, filmstrips, or transparencies.
- Trace projections on the chalkboard.

SOUND RECORDINGS

This category includes tape recordings and phonograph recordings.

TAPE RECORDINGS.

- Provide audio aids when sounds are necessary.
- Cassettes are easily stored.
- Recording can be used many times.
- Can be used with individuals or groups.
- Can be used in conjunction with worksheets, workbooks, and other devices.
- Have possibilities for remedial and review.

PHONOGRAPH RECORDS.

Have most of the characteristics of the tape recording.

VISUALS, NONPROJECTED

Sometimes referred to as graphic aids, this category includes the chalkboard, flannel boards, charts, drawings, graphs, diagrams and posters.

CHALKBOARD.

- Used to focus attention and illustrate some concepts.
- Good for demonstrating how to solve math, diagramming, outlining lesson topics.
- Useful for summary and review.

FLANNEL BOARD.

- Useful in showing organization, listing topics for presentation, summary or review.
- Elements can be quickly added or removed.

CHARTS

- Good for visualizing relationships.
- Useful for showing sequence.
- Better suited to small groups.

DRAWINGS

- Well suited to individual and small group study.
- Excellent for study displays.
- Are easily stored.
- Are inexpensive to reproduce or purchase.

GRAPHS

- Expecially useful as an aid in presenting numerical data.

DIAGRAMS

- Can be used to show relationships, working parts, key features, general outline or layout.

POSTERS

- Communicate a single idea.
- Have eye appeal.
- Aid in motivation.

WRITTEN MATERIALS

In addition to the items presented above, there are certain kinds of written materials which can be useful in presenting information, providing practice and performance and reinforcement. These include, but are not limited to, the following items:

- Textbooks
- Manuals
- Handouts
- Articles
- Instruction sheets
- Operation sheets
- Information sheets
- Assignment sheets
- Job sheets
- Performance guides

GUIDELINES FOR PLANNING METHODS AND MEDIA

This section offers some general guidelines to help you plan for the methods and media. It includes:

General Guidelines

Assessment of Facilities

Assessment of Students

Assessment for Sex Bias

GENERAL GUIDELINES

METHOD SELECTION GUIDELINES. Here are some general guidelines to help in your selection of methods.

- Select a method which seems most compatible with the objective(s) it supports.
- For the sake of efficiency, select a method which provides the best management of the presentation. For example, the introduction of new information might be more effectively managed in a group presentation than in directed self-study.

- If possible, select a method which will permit some flexibility and variations. Any format should be adaptable to changing conditions, such as class size, availability of instructional aids, etc.

- Select a method which is not too restrictive in terms of the media which must be used to support it. The explanation/demonstration format, for example, is not too restrictive because it leaves room for choice of media.

GUIDELINES FOR MEDIA SELECTION. Here are some guidelines to help you select your media.

- Whenever possible, select the actual equipment for explanation, demonstration, and performance.

- Select those media which cover the required skills and knowledges.

- If you are planning lessons to be used by other teachers, try to select those media most likely to be available to all teachers. For example, a certain film might be an excellent way to demonstrate a certain procedure, but it might not be available to all teachers.

- When there is a question on the availability of media, include some alternatives. For example, if a film might not always be available, select other media which could be used to transmit the same information.

ASSESSMENT OF FACILITIES

Before selecting the methods and media, it is helpful to look at existing facilities to see what can be done and what is already available. Some important points of this assessment are as follows:

1. Determine the space and equipment available for demonstration, performance, lab and shop assignments.

2. Determine the projection or sound equipment on hand or available.

3. List the specific items of media on hand or obtainable.

4. List the printed materials on hand or available.

ASSESSMENT OF STUDENTS

Another important consideration in selecting methods and media is the students; that is, how can the learning experiences best meet their needs. Some of the important student characteristics to consider are as follows:

- What are their ages?
- What are their reading levels?
- What are their handicaps?
- Do they have the prerequisite skills and knowledges?
- Are they capable of working independently?
- With what media do they learn best?

These and other considerations will help determine what methods and media most closely match the needs of the students.

ASSESSMENT FOR SEX BIAS

The previous assessments should be followed by an assessment for the elimination of sex bias in instructional materials. The following checklist will be helpful. Although it is only a general summary, it should provide some basic guidelines.

CHECKLIST

ACTIVITY	RATING	
	Acceptable	Unacceptable
Do the media involved make both female and male students feel comfortable in learning about subjects which were formerly for one sex?		
Do the media make special effort to include pictures of male and female students, teachers and adults in nontraditional roles?		
Do learning activities and projects avoid sex stereotyping according to past traditional roles?		
Do the media point out that employers in occupations which formerly hired one sex are now required by law to employ the best qualified candidate regardless of sex?		
The following questions refer to audiovisual materials:		
Does the title have male or female connotations?		
Does the audio reflect male or female bias?		
Do visuals portray males more often than females or the other way around?		
In occupational settings, are adults seen predominantly male or female?		
In school settings, are adults seen predominantly male or female?		
Are characters cast in independent roles (making decisions, acting autonomously) predominantly male or female?		

ACTIVITY	RATING	
	Acceptable	Unacceptable
Are characters cast in aggressive roles (being competitive, dominating or leading) predominantly male or female?		
Are characters cast in subordinate roles (being passive or acting under another's influence) predominantly male or female?		

CHAPTER 5

SEQUENCING THE INSTRUCTION

When you have planned the learning experiences to support the content and objectives, you should next arrange the learning experiences in the most effective and efficient order. That order is referred to as the sequence. This chapter, therefore, discusses the purposes of sequencing and suggests some common approaches.

PURPOSES OF SEQUENCING

A good sequence within the lesson enhances student motivation, makes it easier to teach meaningful relationships, and adds consistency to the teaching content.

STUDENT MOTIVATION

Student motivation depends to a large degree upon a sense of direction. Very early in any lesson, most students look for a mental map of where they are expected to achieve. They look for what is sometimes called advanced organizers, something that will enable them to look ahead and anticipate what is to be learned. If they are made aware of the lesson's organization, they can more easily grasp the big picture. A lesson, therefore, should be so sequenced that students can relate any part of the lesson to that "big picture." This will give them that sense of direction.

MEANINGFUL RELATIONSHIPS

A good sequence can provide the students with a pattern of relationships so that each activity will have a definite purpose. The more meaningful the content, the easier it is to learn, and consequently, the more effective the instruction.

CONSISTENCY OF CONTENT

Proper sequencing also helps to avoid inconsistencies in the content of the lesson. When material is carefully sequenced, it is far less likely that there will be unnecessary duplication in the content. In fact, the presence of duplication is the first sign that the lesson has not been properly sequenced. In addition, careful sequencing also prevents gaps in instruction and makes certain that the development of a skill is orderly and provides for introduction of advanced subject matter content or the performance of more complex procedures.

COMMON APPROACHES TO SEQUENCING

The three most common approaches to sequencing are called the job performance order, the psychological order, and the logical order.

JOB PERFORMANCE ORDER. One method of arranging instructional content is in the sequence in which tasks and task elements are performed. This places instruction, insofar as possible, within the context of the work environment or job situation. As the students learn new tasks, the tasks can be related to the job. Teaching tasks and task elements in the same sequence in which they are performed in the work environment lends a great deal of realism to the instruction. It also provides for better transfer of learning from the instructional to the actual job environment. This method of sequencing would be especially applicable to teaching procedures composed of a series of fixed steps.

PSYCHOLOGICAL ORDER. This method of arranging content is based primarily on the ease of learning something. This means that the students can begin at the most convenient point--in terms of learning--and proceed to levels of new information with increasing difficulty. One sequence might begin with something the student already knows and proceed to new information. This is the known-to-unknown approach. For example, in sequencing a lesson on basic electricity, we might assume that the student knows the basic composition of matter, especially the atom. We could then begin with the known (or at least familiar) and proceed to an explanation of electron theory. The known-to-unknown method can be used repeatedly in one course, for when one begins each lesson, the information in preceding lessons becomes the known upon which to build toward the unknown. Another way to apply the psychological sequence is to begin with what is considered the most simple and proceed to the more difficult. This is called the simple-to-complex. As an example, in teaching electrical circuits, the simple circuit would probably be the easiest for the student to learn. Therefore, the instruction could begin with the simple circuit and continue with the series and parallel types. Still another way to use the psychological method is to begin with the concrete and proceed to the abstract. This is especially useful in teaching general principles. For example, a magnetism lesson would probably be more meaningful to begin with an abstract explanation or the magnetic principle. The same is true in many subjects.

LOGICAL ORDER. The content of instruction will often fall into logical patterns of development because of the combined elements of both job performance and psychological order. For greater learning effectiveness, instructional activities should normally proceed from the simple to the complex or from the known-to-unknown. However, many teaching-learning activities do not lend themselves to such arrangements. In such cases, it is necessary to plan a combination of both job performance order and psychological order. Usually, such an arrangement incorporates the whole-part-whole concept. For example, when teaching the assembly of a carburetor, it probably would be best to begin by demonstrating the entire assembly procedure; then break it into a step-by-step demonstration interspersed with step-by-step participation; and finally recombine all the elements in a complete run-through of the assembly procedure. However, variations of the whole-part-whole concept may have to be applied in certain situations. As mentioned earlier, if a task is too long to be learned effectively as a unit, it may be desirable to divide the task into several operations--always remembering to emphasize the relationship to the whole task. Finally, the task can be practiced in its entirety.

PART TWO -- DEVELOPING LESSON PLANS

If you have made the major decisions explained in Part One, you will have arrived at a sequenced set of learning experiences which support the content and objectives for the lesson. In order for those decisions to be most useful to you, you should write them into some form of a working guide - your guide in carrying out those decisions. This is commonly referred to as a lesson plan. When completed, each lesson plan can help you:

- Prepare for the lesson in advance by obtaining materials, equipment, supplies, etc.
- Prepare the students through a reason for the lesson, a statement of what it will include, and an explanation of the objective(s) to be accomplished.
- Communicate the knowledges and skills clearly and effectively.
- Direct and manage the student activities effectively and efficiently.
- Develop abilities through supervised practice and performance.
- Evaluate performance to assess achievement of lesson objective(s).
- Summarize, remotivate, and make additional assignments.

Part Two deals with lesson plans. Chapter 6 explains the basic fundamentals of lesson plans; Chapter 7 illustrates them with sample lesson plans from a variety of occupational areas and in different formats.

CHAPTER 6

FUNDAMENTALS OF LESSON PLANNING

This chapter reviews the general purposes of lesson plans, discusses functional requirements of performance-based lessons, and presents the general functional components of lesson plans.

PURPOSES OF LESSON PLANS

Generally, a lesson plan is written to serve the teacher by providing how-to-do-it guidance in these areas:

How to prepare
What to teach
How to teach
What to use
Sequence of development
Directions for activities
Flexibility for contingencies
Directions for application and evaluation
Closure

HOW TO PREPARE

As a teacher you must get ready or set the stage for each lesson. This preparation includes two phases: Preparing the instructional environment or setting, and preparing the students.

PREPARING THE INSTRUCTIONAL ENVIRONMENT OR SETTING. A well developed lesson plan will give you sufficient directions in such preparatory activities as preparing the equipment to be used, arranging the classroom furniture, obtaining the required media, and assembling the necessary student materials. A good lesson plan, therefore, will help you be ready to start on time without overlooking any important step of preparation. It will also keep you from wasting student time that might otherwise be taken up after the class starts.

PREPARING THE STUDENTS. At the beginning of each lesson, students should be told what they are going to study and the objectives they are expected to accomplish. There should also be a transitional step from previous lessons to tie in with the lesson about to

begin. Also, you should try to motivate the students by giving a reason for learning or emphasizing the importance of the lesson. Sometimes instructions for assembling supplies or material must be given before the body of the lesson or activity begins. If student materials must be distributed, that activity is also part of the student preparation. A good plan, then, will provide you with an instant reminder to accomplish all of the above activities in the right order.

WHAT TO TEACH

A good lesson plan will include the content or what to teach. It should include or make reference to the objectives to be achieved, the procedural steps to be explained and demonstrated and the related knowledges that must be communicated. A good plan, therefore, is a consistent guide for lesson content.

HOW TO TEACH

Not only does a good lesson plan provide a guide to the content, it also indicates the methods which have been previously determined. It will indicate, for example, when to explain and demonstrate, when to direct practice or when to assign directed study activities. Basically, then, the lesson plan is a how-to-do-it guide.

WHAT TO USE

Possibly, a lesson will include several items of media or resources. A reminder for when to use each item will be useful in conjunction with the WHAT and HOW to teach. A good lesson plan will serve that purpose.

SEQUENCE OF DEVELOPMENT

A good lesson is not merely a collection of skills, knowledges, methods, media, and activities. Instead, it represents an orderly progression from the beginning to the end. Thus, it provides the sequence of lesson development.

DIRECTIONS FOR ACTIVITIES

In performance-based instruction, students learn by participating in meaningful experiences or activities. The lesson plan should give a systematic guide for directing those activities.

FLEXIBILITY FOR CONTINGENCIES

No two classes are alike, and no two students are alike. This means that a lesson plan must be flexible enough to permit adaptation to contingencies. Such flexibility will allow you to cover the required content and still be flexible enought to adapt the instruction to changing situations.

DIRECTIONS FOR APPLICATION AND EVALUATION

The main thrust of a good lesson is what the students are required to do in application of what has been taught. That application is subject to an evaluation of the performance. A good lesson plan can help in both areas because it can give specific directions on how to direct the applications and also how to evaluate them.

CLOSURE

Since each lesson should close with a sense of achievement, a good lesson plan can give directions to ensure that you tie it all together. It can provide guidance in such areas as summary, reemphasis and remotivation, as well as further assignments to be made.

FUNCTIONAL REQUIREMENTS OF PERFORMANCE-BASED LESSONS

Since lesson plans are designed to guide you in conducting effective lessons, it is convenient to consider some of the important functional requirements of performance-based lessons. Three of the most important are motivation, progressive presentation, and competency development.

MOTIVATION

There is no magic formula for causing students to become motivated. Sometimes poor attitudes can be changed; sometimes it is very difficult to do so. However, there are some steps that can be taken in a good lesson that will enhance motivation. They will not guarantee that ALL students will become or remain motivated, but they will increase the probability. Sometimes referred to as the motivation steps, they include attention, reason for learning, and an overview of the lesson.

ATTENTION. One of the first steps toward developing a positive attitude is gaining attention. When a lesson begins it is necessary to have the class's attention. A good lesson, therefore, must have provisions for gaining attention. Again, there is no magical formula for doing that, for there are several variables that must be considered such as personality of the teacher and nature of the subject matter. But there are some methods which have been effective for many teachers. Some of them are:

- Using a slide, project the title of the lesson.
- Write the title of the lesson on the board as the class members watch.
- In a clear, audible voice inform the class that the lesson is about to begin. Then state what the lesson is about.

REASON FOR LEARNING. The second and perhaps the most important aspect of developing a positive attitude is to give a valid reason for learning what is about to be taught. In giving this reason you should try to communicate the benefits to the students. Some benefits to consider are:

- Lesson will add to what was taught in a previous lesson.
- Lesson will prepare for subsequent lessons.

- Lesson will develop competency in a skill or task.
- Skill or task learned will contribute to the job.
- Lesson will contribute to subsequent lessons.

OVERVIEW. Not only must there be a reason for learning, but learning will usually be enhanced if the big picture is provided in the beginning. This serves as an advance organizer for the teaching-learning activities. Some of the ways to provide such an overview are as follows:

- Inform the students of the objective.
- List the main divisions or topics of the lesson on the chalkboard.
- Show a transparency or slide depicting the lesson's organization.
- For a complicated lesson, prepare an outline and distribute it as a handout.
- Tell the students what will be covered in the lesson.
- Tell the students what they will be expected to do.

PROGRESSIVE DEVELOPMENT

A good performance-based lesson should be so planned that it does not ramble or digress. It should start at a definite beginning and continue logically and progressively until the end. This requires that the planning provides progressive steps, active participation, and knowledge of results.

PROGRESSIVE STEPS. The enabling objectives or major steps provide stepping stones to achievement of the performance objectives and provide the structure. In order for this structure to be progressive, it should be sequenced by one or more of these general methods presented in Chapter 5.

ACTIVE PARTICIPATION. One of the key principles of performance-based instruction is active student participation. When this principle is applied, the student becomes an active partner in the teaching-learning activities instead of a passive listener, observer, or reader. A lesson plan for performance-based instruction should include the student experiences for generating active participation.

KNOWLEDGE OF RESULTS. In addition to the experiences for active participation, each lesson plan should include provisions for giving timely knowledge of results or reinforcement. For example, inform the students after each step or practice session or critique an exercise after completion to show what the right answers should have been. Students should also be reinforced after the major lesson application. Summaries and reviews are also helpful.

COMPETENCY DEVELOPMENT

In performance-based instruction, the main thrust of each lesson should be the development of a competency, either performance of a task or the application of mental skills and knowledges. The lesson plan, therefore, should have major segments devoted to competency development including application, evaluation, and closure.

APPLICATION. In the progressive development of a lesson, there should be interactive response: that is, each student should be provided opportunities to practice the enabling objectives or major steps. The ultimate response is the total application--putting it all together to perform the task. This should be a major portion of each lesson, for it is here that the lesson becomes performance-based to the highest degree.

EVALUATION. When application is being made, you must also evaluate. Such evaluation, based precisely on the performance objective, must be both timely and objective. Therefore, your lesson plan should include directions for evaluating the performance. It should also remind you to provide knowledge of results to each student.

CLOSURE. Each lesson should end with a sense of accomplishment. Simply stated, there should be a reminder in your lesson plan so that you can end the lesson by summarizing what has been accomplished, leaving the students with the feeling that something meaningful and important has been achieved.

FUNCTIONAL COMPONENTS OF LESSON PLANS

In this section we shall consider the major components which are common to most lessons. This is not an attempt, however, to establish a rigid format. These components are the functional elements--the working parts--which you can adapt to your own format and lesson requirements. You will find variations of these components in the next chapter.

COVER PAGE

Each lesson plan may have a cover page which includes indentification of the lesson, performance objectives, enabling objectives or major steps, equipment and materials, references and teaching aids, and safety consideration when applicable.

BODY

The body of the lesson contains sections for the preparation, presentation and development, application, evaluation, and summary and closure. Again, these sections may appear under different titles, depending upon the preference of the teacher.

PREPARATION. This section usually includes both teacher preparation and student preparation.

The teacher preparation contains directions to you on how to get ready for the lesson. It often includes reminders to do such things as:

- Review the text or other information source.

- Review the lesson plan.
- Review student materials.
- Update the body of the lesson plan.
- Make necessary preclass assignments.
- Obtain necessary supplies and equipment.

Remember: YOU must be ready for the lesson. This part of the lesson plan will help you do that.

Student preparation may include your predetermined directions for the following:

- Check on any preclass assignments.
- Introduce the lesson and gain attention.
- Provide an overview of the lesson.
- Motivate the class with appropriate reasons for learning.

PRESENTATION/DEVELOPMENT. In this section the plan includes step-by-step guidance for conducting those learning experiences you have selected. It usually contains an outline of content and directions for student activities.

The content is your sequenced outline of the knowledges and/or skills to be taught. Usually, it will begin with the introductory information. The rest is organized to help you reach the enabling objectives or major steps. Along with each enabling objective appears the sequenced knowledges and/or skills which must be presented.

The directions for activities supplement the content by indicating whether you will explain, discuss, ask questions, etc. They may also include the instructional aids you will use in doing so, such as slides, charts, handouts, chalkboard, etc. Also, there will usually be directions for what you will have the students do periodically to apply the knowledges or skills being taught.

APPLICATION. This important component of the lesson plan is where you put it all together. In the presentation/ development, knowledges and skills are presented and applied in progressive steps. In the application, the students become involved in application, practice, and performance of the performance objective. This may include a practice session in which performances are reinforced and corrected to be followed by performance for formal evaluation. Your lesson plan should include sufficient guidance for you to conduct, supervise, and monitor the application.

EVALUATION. As each student completes the application required in the previous section, you should make a formal assessment of performance based on the standard of the performance objectives. This will require, in many cases, specific guidelines on HOW to evaluate the performance.

SUMMARY AND CLOSURE. This final section serves to bring the lesson to a meaningful closing. It includes a summary, when applicable, a reemphasis on the importance of the lesson and any directions for subsequent assignments.

CHAPTER 7

SAMPLE LESSON PLANS

There is no one lesson plan format which is used universally, for what works best for one teacher might not be acceptable to another. The only requirement is that you use the one most suited to you--one which you can modify to meet your needs and revise periodically as you revise your instruction.

In order to assist you in selecting a format and to show how the planning decisions are reflected in the functional components, this chapter presents a series of samples. They cover a variety of tasks from different occupational areas. You should remember, however, each of those lesson plans illustrates ONE approach. You are not obligated to use any format shown. It is hoped that the samples will be helpful to you because they illustrate HOW lesson plans in different formats can be developed.

Included in this chapter are:

Sample 1 - Prepare Checks for Payment

Sample 2 - Servicing Spark Plugs

Sample 3 - Sew on Buttons (with Thread Shanks)

Sample 4 - Give a Plain Shampoo

Sample 5 - Taking and Storing Deciduous Hardwood Cuttings

Sample 6 - Measure and Record Pulse

Sample 7 - Fill Out Cash Register Summary Sheet

SAMPLE 1
PREPARE CHECK FOR PAYMENT

This is a rather detailed lesson plan for a task in Business and Office.

The main parts of this plan are the cover page and the body.

Included in the cover page are the performance objectives; enabling objectives; tools, equipment and materials; references and teaching aids; and a heading for safety.

Functional Components which make up the body are identified as:

PREPARATION

PRESENTATION AND DEVELOPMENT

APPLICATION

EVALUATION

SUMMARY AND CLOSURE

In this lesson, students learn through listening, observing, and doing. Those experiences are facilitated through lecture (explanations), demonstration and performance. Note how the experiences have been sequenced so that the lesson progresses from the introductory information through each enabling objective until the performance objective has been achieved. Note also the periodic reinforcement which is provided.

To see how media can be used to support the learning experiences, read the listing on the cover page. Then read through the lesson plan to see how each is actually used.

Although this sample contains more content detail than the experienced teacher would probably need, such a detailed plan would be helpful for new teachers and for substitute teachers.

LESSON PLAN

COURSE:

UNIT:

LESSON: Prepare Check for Payment

PERFORMANCE OBJECTIVE: Provided a blank check for student use and information concerning dates, payee, drawer, amount, previous deposits and balance, and check writing guidelines, prepare the check and stub without error.

ENABLING OBJECTIVES:

1. Given a list of terms pertaining to checks, write the definition for each term.
2. Given a completed sample check, label each part of the check and stub. Label all parts correctly.
3. Given information or required check payment and blank check stubs, fill in the stubs without error.
4. Provided information on payment by check and sample checks, write the checks without error.

TOOLS, EQUIPMENT AND MATERIALS: None required.

REFERENCES AND TEACHING AIDS:

1. Text, BANKING PROCEDURES, Chapter 7
2. Assignment Sheet 1-1, "Checkwriting Terms"
3. Assignment Sheet 1-2, "Parts of a Check"
4. Task Sheet 1-2, "Checkwriting Procedures"
5. Assignment Sheet 1-4, "Checkwriting Practice"
6. Worksheet 1-5, "Prepare Check for Payment"
7. Selected Transparencies
8. Chalkboard
9. Overhead Projector

SAFETY: Not Applicable

I. PREPARATION

A. Preclass Instructor Preparation

1. Review Chapter 7 in text, BANKING PROCEDURES.
2. Review lesson plan.
3. Review student materials and determine specific use.
4. Select method(s) and annotate right column in lesson plan to reflect planned activities and use of materials.
5. Make necessary preclass assignments.

B. Student Preparation

1. Complete reading assignments on Assignment Sheets 1-1 and 1-2 prior to class.
2. Introduce lesson and tie in with previous lessons.
3. Give brief preview of lesson to include:
   a. Task to be accomplished
   b. Performance objectives
   c. Enabling objectives
   d. Application and evaluation
4. Emphasize importance of checkwriting.

II. PRESENTATION AND DEVELOPMENT

CONTENT	ACTIVITIES
A. Introductory Information	
1. Checking account as a contract between bank and depositor	Define checking account.
2. Advantages of paying by check a. Checkbook record of cash paid out b. Cancelled checks as proof of payment c. Convenience in paying and mailing d. Safety	Explain advantages
B. Terms Pertaining to Checks	
ENABLING OBJECTIVE: Given a list of terms pertaining to checks, write the definition for each term.	
CONTENT	ACTIVITIES
1. Check - written order from depositor directing bank to pay specific sum of money to one named on check 2. Cash - coins, paper money, checks, money orders and money deposited in bank 3. Currency - paper money 4. Signature card - card filed by bank to show who is authorized to sign	Explain terms, using chalkboard or transparencies.

checks for the account
5. Depositor - one in whose name money is placed in the bank
6. Drawer - the depositor
7. Drawee - the bank
8. Payee - the one who receives the payment

Direct students to complete exercises in Assignment Sheet 1-1, "Checkwriting Terms."

Inform students of correct answers.

C. Parts of a Standard Check

ENABLING OBJECTIVE: Given a completed sample check, label each part of the check and stub. Label all parts correctly.

1. The Stub or Source Document
   a. Check number and amount
   b. Date
   c. Payee
   d. Reason for payment
   e. Balance brought forward
   f. Deposits
   g. Totals
   h. Balance less check

Using transparencies, explain parts of stub and check.

CONTENT

ACTIVITIES

2. The Check
   a. Check number
   b. Date
   c. Payee
   d. Figure amount
   e. Written amount
   f. Drawee
   g. Drawer
   h. Signature
   i. ABA number
   j. Magnetic ink characters including
      (1) Bank identification number
      (2) Depositor's account number

Direct students to complete exercise in Assignment Sheet 1-2, "Parts of a check." Show transparency to confirm exercise.

D. Fill in Check Stub

ENABLING OBJECTIVE: Given information on required check payment and blank check stubs, fill in the stubs without errors.

CONTENT	ACTIVITIES
1. Fill in check stub before writing check. 2. Make sure balance is up-to-date. 3. Record deposits. 4. Total previous balance and deposits. 5. Record amount of check. 6. Subtract and record new balance. 7. Record balance on next check stub.	Using transparency, explain the steps in filling out the stub. Write information on chalkboard and have students practice filling in check stubs. Show transparency of completed stubs and have students check their work.
E. Write the Check	
ENABLING OBJECTIVE: Provided information on payment by check and sample checks, write the checks without error.	Using transparency, explain the steps in writing the check.
1. Write check number, if not prenumbered. Use next number. 2. Write date on which check is being issued. 3. Write the payee's name in full: a. Start at extreme left. b. Omit personal titles. c. Draw line from end of name to dollar sign. 4. Write amount of check in figures: a. Place first digit directly after dollar sign. b. Write cents as fractions of 100 c. Circle amounts under one dollar. 5. Write the amount in words: a. Begin at extreme left. b. Separate dollars and cents with word "and." c. Write cents as fractions of 100. d. Draw line from cents to "DOLLARS." For amount less than $1, write "Only_____cents." 6. Inspect the check for accuracy before it is presented for signature.	Direct students to write check for practice using Task Sheet 1-3, "Check-writing Procedure." Inspect work and make direct corrections as required.

III. APPLICATION

A. For practice prior to the criterion-referenced measure, direct the students to complete Assignment Sheet 1-4, "Checkwriting Practice." Check the work and clear up any misconceptions.

B. For formal assessment of the performance objective, direct students to complete Worksheet 1-5, "Prepare Check for Payment." Instruct students to turn in worksheets immediately upon completion.

IV. EVALUATION

Evaluate each worksheet according to the following guidelines.

A. Check stub must contain each of the following correctly written and computed:

1. Balance brought forward
2. Record of deposits
3. Total of previous balance and deposits
4. Amount of check
5. New balance

B. Check must contain each of the following correctly written:

1. Check number
2. Date
3. Payee's name
4. Amount in figures
5. Amount in words

V. SUMMARY AND CLOSURE

A. Summarize the main points of the lesson, giving special attention to areas of experienced difficulties or weaknesses.

1. Checkwriting terminology
2. Parts of standard check
3. Checkwriting procedures

B. Reemphasize the importance of accuracy and correctness in preparing checks.

C. Make student assignment for next lesson.

SAMPLE 2

SERVICING SPARK PLUGS

This example, taken from Automotive Mechanics, illustrates a lesson plan (called Instructional Guide) developed for use by several instructors. Because it contains the basic functional elements, it can be personalized by any instructor who wishes to do so. By adding more directions, additional media, more content detail, and additional activities, each instructor can adapt it quickly and easily to his or her needs and preferences. Because it contains the basics, it can also help to standardize the instruction in the fundamental skills and knowledges.

Format includes a beginning section in which the unit, lesson title, task and performance objective are stated. This is followed by a PREPARATION section which includes suggested teacher and student preparation and a listing of the media under the heading "Resources/References."

The PRESENTATION/DEVELOPMENT section contains four columns for related knowledges, major steps and procedures, methods/media, and student activity. Blank spaces may be filled in by any instructor who wishes to make additions.

The remaining sections are identified as APPLICATION, EVALUATION (CRITERION-REFERENCED MEASURE), and SUMMARY/CLOSURE.

The students are expected to learn through listening, observing and doing. Methods which facilitate those experiences are lecture techniques (explanation), demonstration, and performance. Reinforcement is provided after each practice step and after the performance evaluation.

Numbers and letters indicate the sequence of development for both related knowledges and major steps and procedures.

Note how the resources items listed in the PREPARATION are further identified in the METHODS/MEDIA column of the PRESENTATION/DEVELOPMENT section.

UNIT:	Engine Tune-Up
LESSON:	Servicing Spark Plugs
TASK:	Clean, Gap, and Test Spark Plugs
PERFORMANCE OBJECTIVE:	Given an automobile needing spark plug service, and access to the appropriate tools, equipment, and service manual, clean and gap the spark plugs, and place them back into the automobile according to the manufacturer's specifications and procedures.

PREPARATION

Teacher Preparation

1. Make sure engines are available for demonstration and performance.
2. Obtain transparencies and handouts if used.
3. Make sure all tools will be readily available as needed.
4. Have assorted spark plugs ready for students to inspect and to use in practice.
5. Obtain the necessary student performance guides if not previously given.

Student Preparation

1. Explain the importance of properly firing spark plugs:
   a. Efficient engine operations
   b. Fuel economy
2. Explain benefits of lesson:
   a. Required on the job
   b. Servicing one's own car
3. State the performance objective.
4. Give a brief overview of the lesson.

Resources/References

Engine with spark plugs installed
Spark plug wrench
Spark plug tester
Brush and file
Spark plug cleaning machine (if available)
Feeler gauge
Assorted spark plugs in normal and abnormal conditions
Manufacturer's manual or copies of spark gap specifications
Transparencies or handouts to illustrate parts of spark plugs
Student performance guides

PRESENTATION/DEVELOPMENT

RELATED KNOWLEDGE	MAJOR STEPS AND PROCEDURES	METHODS/MEDIA	STUDENT ACTIVITY
1. Spark plug composition a. Porcelain (1) Insulation (2) Heat dissipation b. Steel (1) Center part (2) Base		Explanation and Observation Transparencies Spark plugs	Examine spark plugs to observe porcelain and steel composition.
2. Spark plug components a. Terminal b. Seal c. Insulator d. Rib to reduce flash-over e. Flats for wrench f. Seal g. Shell h. Gasket seal i. Center electrode j. Threads k. Side electrode l. Gap		Explanation and Observation Transparencies Handouts Written exercises	Observe spark plugs; identify components orally or in written exercises.
3. Spark plug conditions a. Oil fouling b. Gas fouling c. Burned or overheating d. Normal conditions e. Carbon fouling f. Silicone deposit g. Splashed fouling		Explanation and Observation Transparencies Handouts Spark plugs	Observe different spark plugs and identify the conditions.

PRESENTATION/DEVELOPMENT

RELATED KNOWLEDGE	MAJOR STEPS AND PROCEDURES	METHODS/MEDIA	STUDENT ACTIVITY
d. Explain safety precautions for using compressed air.	4. Remove spark plugs: a. Remove spark plug wires. b. Loosen spark plug. c. Clean the area around spark plug. e. Remove spark plugs from head. f. Remove gaskets if required.	Explanation Demonstration Practice Engine with plugs installed Spark plug wrenches Compressor (Optional) Rags for cleaning	Practice removing spark plugs. Each student should remove at least one.
a. Explain that cleaning will be done if inspection indicates plugs are not defective. c. Emphasize safety precautions for using compressed air.	5. Clean spark plugs: b. Clean plugs on cleaning machine or with file, compressed air and other devices. d. Clean threads with wire brush.		Practice cleaning plugs.
d. Explain that electrode surfaces must be parallel.	6. Set spark plug gaps: a. Look up spark gap in manual. b. Use gauge to check gap. c. Bend ground electrode to open or close gap.	Explain Demonstration Practice Spark plugs Manuals or other specifications for spark gaps Spark plug gauge Screwdriver	Practice setting spark gaps; include both opening and closing.

PRESENTATION/DEVELOPMENT

RELATED KNOWLEDGE	MAJOR STEPS AND PROCEDURES	METHODS/MEDIA	STUDENT ACTIVITY
a. Explain how to use testing machine.	7. Test the spark plugs: b. Test plugs and determine their efficiency.	Explanation Demonstration Practice Testing Machine Spark plugs	Practice testing spark plugs.
e. Emphasize: Push plug wires securely into place and make sure they are in the brackets or holders.	8. Install spark plugs: a. Coat threads with engine oil. b. Install plugs. c. Torque to specifications. d. Replace plug wires in proper order.	Explanation Demonstration Practice Engine Spark plugs Wrenches	Practice installing spark plugs.

APPLICATION

Have each student to service at least two spark plugs to include removal, cleaning, setting the gaps, testing and replacement.

EVALUATION (Criterion-Referenced Measure)

Evaluate the above activity to ensure:
(1) Plugs are completely cleaned.
(2) Gaps have been set to specifications.
(3) The decisions based on the testing machine are correct.
(4) Plugs have been properly replaced and torqued.

SUMMARY/CLOSURE

1. Summarize the lesson, emphasing the major steps.
2. Reemphasize the importance of properly firing spark plugs.
3. Make the necessary assignments for next lesson.

SAMPLE 3

SEW ON BUTTONS (WITH THREAD SHANKS)

This lesson plan for a Home Economics task has all functional components explained in Chapter 6 and illustrated in previous examples in this chapter. Somewhat different in format, it is a good example of how lesson plan components can be adapted to the teaching-learning needs of this service area.

It has a beginning section which is used to identify the unit, task and performance objective. This is followed by six numbered sections:

I. TEACHER PREPARATION - lists the tools and equipment, instructional materials, references and other resources.

II. PREPARATION OF LEARNER - suggests ways to establish set and enhance motivation.

III. CONTENT OF LESSON - contains three columns in which the enabling objectives and content, methods/activities and resources appear in a teaching sequence.

IV. SUMMARY - provides for review and reinforcement.

V. CRITERION-REFERENCED MEASURE - describes what student must do to demonstrate achievement of the objectives.

VI. ASSIGNMENT - has provisions for remedial activities; previews what is expected at the next class session.

The students in this lesson learn through listening, observing, and practicing. The primary methods are explanation, demonstration, and practice. Enabling objectives provide for the major checkpoints in the lesson.

As in other examples, blank spaces make it convenient for the teacher to add to the plan as necessary for personal use.

HOME ECONOMICS EDUCATION
PLAN OF INSTRUCTION

UNIT: ALTERING CLOSURES AND FASTENERS DATE: July 6, 1978

TASK: Sew on Buttons (With Thread Shanks)

PERFORMANCE OBJECTIVE: Given a garment and necessary equipment and supplies, sew buttons on garment as marked, allowing for buttonhole thickness plus 1/8 inch for movement.

I. TEACHER PREPARATION

Tools and Equipment: (1) Needle (2) Thread (3) Thimble (4) Buttons (5) Pins (6) Thread clips (7) Scissors (8) Shears (9) Bobby Pin (10) Match

Instructional Materials: (1) Handout (2) Practice Piece (3) Live Work (4) Garment with shank buttons or (5) Illustrative pieces with buttons.

References: The Vogue Sewing Book, p. 288; Altering Ready-To-Wear, Brinkley-Aletti, 1976, p. 293; Ready to Sew, Butterick, p. 215.

Other Resources: Sew and Sew, Butterick, Volume 5, Folder 5 -

II. PREPARATION OF LEARNER: (Establish Set/Motivation)

Show examples of buttons sewn without and with shanks on heavy fabric.
Discuss need for button shanks.
Show collection or samples of buttons sewn correctly and incorrectly.

III. CONTENT OF LESSON:

ENABLING OBJECTIVES/CONTENT	METHODS/ACTIVITIES	RESOURCES
1. Given a garment and necessary equipment and supplies, secure thread to garment through markings from outside of garment. Securing Thread • Stitching procedure	• Teacher demonstrates securing threads. • Students interact. • Students practice securing threads to garment through markings.	Equipment/Supplies Practice piece/Live work
2. Using garment with thread secured through markings from outside and necessary equipment and supplies, sew buttons on garment using smooth, even stitches. Sewing on Buttons • Stitches used • Allow for fabric thickness • Thread shanks	• Teacher demonstrates sewing on buttons. • Students interact. • Use handout, illustrative material or use transparency (attached). Students practice sewing on buttons with thread shanks	Handout or transparency See and Sew, Butterick, Vol. 5, Folder 5 Practice piece/Live work

III. CONTENT OF LESSON:

ENABLING OBJECTIVES/CONTENT	METHODS/ACTIVITIES	RESOURCES
3. Using garment with buttons sewed on and necessary equipment and supplies, anchor buttons, leaving a neat appearance from top and underside.		
Anchoring Buttons • Stitches • Tying off threads • Cutting threads	• Teacher demonstrates anchoring buttons. • Student interact. • Students practice anchoring buttons.	Equipment/Supplies Practice piece/Live work

IV. SUMMARY: (Review main points, draw conclusions)

Discuss and evaluate methods of:

1. Securing threads
2. Sewing on buttons
3. Anchoring buttons

V. CRITERION REFERENCED MEASURE: (Determine if learner has reached objective.)

Given a garment and necessary equipment and supplies, sew buttons on garment as marked, allowing for buttonhole thickness plus 1/8 inch for movement.

VI. ASSIGNMENT: (Explanation of what is expected at next class session)

Practice sewing buttons with thread shanks (Slow learners). Show example of button with self shank to stimulate interest. Assign students to bring collection of self-shank buttons to next class.

SAMPLE 4

GIVE A PLAIN SHAMPOO

Selected from Cosmetology, this sample follows the same format as the previous example from Automotive Mechanics. Developed jointly by teams of cosmetology instructors, a volume of these lesson plans has been printed for use by all secondary cosmetology teachers. Like the other examples, this one contains blank spaces in which each teacher is encouraged to make additional entries to personalize the plan.

You will find that in this example, the first two columns in the PREPARATION section must be filled in by the teacher.

The related knowledge and major steps and procedures are numbered in the suggested teaching sequence.

Note that in the APPLICATION AND EVALUATION sections, the activities are specified for both instructor and student.

INSTRUCTIONAL GUIDE

UNIT:

LESSON:

TASK: GIVE A PLAIN SHAMPOO

PERFORMANCE OBJECTIVE: Provided a patron and the necessary supplies and equipment, give a plain shampoo. The shampoo must remove all oil, soil and debris from the hair and scalp without adversely affecting either the hair or scalp.

PREPARATION

Teacher Preparation	Student Preparation	Resources/References
		REFERENCES: The Van Dean Manual Standard Textbook of Cosmetology RESOURCES: Patron (real or simulated) Transparencies Shampooing implements Brush Comb Neck Strip Shampoo Cape Shampoo Shampoo Chair Shampoo Bowl Towels

PRESENTATION/DEVELOPMENT

RELATED KNOWLEDGE	MAJOR STEPS AND PROCEDURES	METHODS/MEDIA	STUDENT ACTIVITY
1. Introduction to Shampoo a. Purpose of shampoo b. Frequency of shampoo c. Type of water (hard or soft)		METHOD: Explanation or self-study MEDIA: VDM: 41-42 STC: 43-44	State purpose and frequency of shampoo. Determine the type of water in facility.
	2. Make Preparations a. Select and arrange materials. b. Wash and sanitize hands. c. Greet and seat patron. d. Ask patron to remove neck and/or ear jewelry and glasses. e. Drape patron. CAUTION: DO NOT allow shampoo cape to come in contact with patron's skin. f. Remove all hairpins and combs. g. Examine condition of hair and scalp. h. Select shampoo according to condition of hair. i. Brush hair thoroughly. CAUTION: DO NOT brush hair: (1) Before giving a lightening treatment. (2) Before applying a tint or toner. (3) Before giving a permanent.	METHOD: Explanation/ Demonstration MEDIA: Transparencies Shampooing Implements Brush Comb Neck strip Shampoo cape Shampoo chair Shampoo Towels Patron (real or simulated)	Practice selecting shampoo according to various hair conditions.

	(4) Before applying a chemical hair relaxer. (5) If the scalp is irritated.		List five conditions in which the hair should NOT be brushed before a shampoo. Practice making preparations for a plain shampoo to include: Selecting and arranging materials. Washing and sanitizing hands. Seating and preparing patron. Selecting shampoo. Brushing hair thoroughly.
	3. Shampoo hair a. Adjust shampoo cape over back of shampoo chair. b. Test water temperature. c. Adjust volume of water spray. d. Wet hair thoroughly. CAUTION: Protect patron's ears if she is sensitive to water in her ears. e. Apply shampoo. CAUTION: DO NOT allow shampoo to get into patron's eyes. f. Give manipulations. CAUTIONS: DO NOT use vigorous scalp manipulations if:	METHOD: Explanation/ Demonstration MEDIA: Shampooing implements Shampoo bowl Shampoo	

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PRESENTATION/DEVELOPMENT

RELATED KNOWLEDGE	MAJOR STEPS AND PROCEDURES	METHODS/MEDIA	STUDENT ACTIVITY
	(1) Scalp is sensitive. (2) Scalp is irritated. (3) Patron requests less pressure. (4) Shampoo is to be followed by a permanent. (5) Shampoo is to be followed by hair coloring or hair relaxing. g. Rinse hair thoroughly. h. Make second application of shampoo and rinse thoroughly.		List five conditions in which vigorous scalp manipulations should be avoided. Practice shampooing hair to include manipulations and rinsing.
	4. Partially towel-dry hair a, Towel-dry excess moisture from hair before leaving shampoo bowl. b. Wipe excess moisture from patron's face and ears. c. Drape patron's head with towel. d. Massage scalp, through towel, until the hair is partially dry.	METHOD: Explanation/ Demonstration MEDIA: Same as above.	Practice partially towel-drying hair.
	5. Complete the shampoo a. Comb. b. Set. c. Dry. d. Comb out.	METHOD: Explanation/ Demonstration MEDIA: Dryer and comb	Comb, set, dry, and comb-out hair.

PRESENTATION/DEVELOPMENT

RELATED KNOWLEDGE	MAJOR STEPS AND PROCEDURES	METHODS/MEDIA	STUDENT ACTIVITY
	6. Cleanup a. Discard used materials. b. Place unused supplies in proper storage. c. Wash and rinse combs and brushes and place in wet sanitizer. d. Clean and sanitize shampoo bowl. e. Wash and sanitize hands.	METHOD: Explanation/ Demonstration MEDIA:	Practice cleaning up after giving a plain shampoo.

APPLICATION

INSTRUCTOR: Provide each student a patron (real or simulated) and the necessary equipment and supplies to give a plain shampoo. Provide individual supervision, as necessary.

STUDENT: Using the materials and supplies provided, practice giving a plain shampoo to a patron (real or simulated) under supervision.

EVALUATION (Criterion-Referenced Measure)

INSTRUCTOR: Provide each student a patron and the necessary equipment and supplies to give a plain shampoo.

STUDENT: Give a plain shampoo to the patron provided.

INSTRUCTOR: Evaluate according to performance objective.

SUMMARY/CLOSURE

1. Introduction to shampoo
2. Making preparations
   - Selecting and arranging materials
   - Washing and sanitizing hands
   - Greeting and seating patron
   - Selecting shampoo
   - Preparing patron
3. Giving the shampoo
   - Adjusting volume and temperature of water
   - Applying shampoo
   - Giving manipulations
   - Rinsing
   - Making second application of shampoo and rinsing
4. Partially towel-drying hair
5. Completing shampoo
   - Comb
   - Set
   - Dry
   - Comb-out
6. Cleaning-up
   - Disposition of:
   - Used materials
   - Unused materials
   - Combs and brushes
   - Cleaning shampoo bowl
   - Washing and sanitizing hands
7. Assignments

SAMPLE 5

TAKING AND STORING DECIDUOUS HARDWOOD CUTTINGS

Developed jointly by a term of Agribusiness teachers, this sample is representative of the printed volume titled "A Catalog of Instructional Guides for Performance-Based Instruction for Nursery Production." The volume provides guidance for teaching the required tasks. Designed as the basic guide or lesson plan, it can be modified by each teacher who elects to use it. You will note that it does not include "PREPARATION" and "SUMMARY/CLOSURE" section; it is assumed that teachers will add those portions in whatever formats desired.

Some of the important features of this basic plan are as follows:

1. The task and performance objectives are stated at the top of the first page.

2. The structure and content are included in the first column on the left under the heading MAJOR STEPS/SUPPORTING SKILLS AND KNOWLEDGES. This is an outline in suggested teaching sequence of what is to be taught.

3. A RESOURCES column identifies the equipment, supplies and the other instructional materials by type. Each teacher can write in the specific printed and audiovisual materials. Appendices in the back of the volume give detailed listings of instructional materials.

4. The METHODS column identifies general methods to which each teacher can add more specific learning experiences.

5. A STUDENT ACTIVITIES column includes the major student performances with space for additional activities to be added.

NOTE: In selecting the approach, the team considered both the needs of the average student and the special needs student. By including the basic guidance, they have provided a plan for general instruction. At the same time, they left room for the guide to be modified through additional methods, media and activities for the special needs student.

PERFORMANCE-BASED INSTRUCTIONAL GUIDE

TASK: No. 13 — Taking and Storing Deciduous Hardwood Cutting

PERFORMANCE OBJECTIVE: Given healthy, dormant, deciduous plants, and necessary tools, take cuttings from current season's growth. Satisfactory performance is realized if cuttings are 8 to 12 inches long, bundled 25 to 30 per bundle with all basal ends together and properly stored.

MAJOR STEPS/SUPPORTING SKILLS & KNOWLEDGES	RESOURCES	METHODS	STUDENT ACTIVITIES
1. Select and cut plant materials from which hardwood cuttings will be taken. - Time of year to make cuttings. - Select wood for cutting. - Determining current seasons growth. - Cut plant materials. - Bundle, date and label plant materials. - Basal cuts should be at same end of bundles. - Bundles should be of convenient size for handling. - Label with appropriate information for future reference. - Store temporarily, to avoid drying out or freezing.	Equipment and Supplies - Stock plants - Pruning shears or clippers - Label and marker - Twine for tying in bundles - Storage area Printed Materials/Audio-visuals	Explanation/Demonstration Practice/Performance Simulation	Select and cut plant materials from which hardwood cuttings will be taken. (Continued)

MAJOR STEPS/SUPPORTING SKILLS & KNOWLEDGE	RESOURCES	METHODS	STUDENT ACTIVITIES
2. Make and bundle the cuttings. - Take the cuttings from harvested plant materials. - Length of cuttings should be 8" to 15". - There should be at least 3 nodes on each cutting. - Bundle cuttings in groups of 25 or 50. NOTE: Be sure all basal cuts are at the same end of the bundle.	Equipment and Supplies - Clippers or shears - Stock wood - Twine for tying in bundles Printed Materials/Audio-visuals	Explanation/Demonstration Individualized Instruction Practice/Performance	Make and bundle deciduous hardwood cuttings.
3. Store cuttings. - Store by burying bundles in sawdust, shavings, or similar materials in an appropriate area and/or a refrigerated facility to maintain dormancy.	Equipment and Supplies - Storage area - Sawdust, shavings or similar material	Explanation/Demonstration Individualized Instruction Practice Performance Simulation	Store hardwood cuttings. CRM: Take and store deciduous hardwood cuttings from plants provided by instructor.

SAMPLE 6

MEASURE AND RECORD PULSE

Representing a Health Occupations lesson, this example has the common elements of the previous examples.

The first part identifies the unit, lesson, task, objective, equipment/materials, teaching aids, and references.

The PREPARATION section has general directions for motivating the student and establishing the learning set.

Following this section, the PRESENTATION section makes up the body and is divided into two columns: one for the procedures to be demonstrated and the second for the key points of related knowledges. Although not as detailed as other samples, the two columns provide the basic content and structure to which the teacher can add further details as necessary.

An APPLICATION section provides guidance for practice: the TEST section provides for evaluation. ASSIGNMENTS are made in the last section.

Unit_____

Lesson_____

TASK: Measure and record radial pulse.

OBJECTIVE:

Given a patient, a watch with a second hand, a note pad, and a pen, measure and record the radial pulse rate. When counted twice, each count must agree to within plus or minus 4 counts.

EQUIPMENT/MATERIALS:

1. Watch with second hand
2. Note pad
3. Pen
4. Graphic Chart
5. Nurse's Notes

TEACHING AIDS:

1. Transparencies
2. Anatomical charts

REFERENCES:

Nursing Skills for Health Occupations, Saunders, Jones, Lucille, Brown-Western, 1978.

I. PREPARATION (of the student)

A. Explain importance of the pulse and its correct measurement.

B. State that lesson will prepare participants to measure and record radial pulse.

II. PRESENTATION

Operations or Steps	Key Points
	1. Using anatomical charts, explain the location of the radial arteries.
	2. Explain how to describe the force and rhythm of pulse beats.
2. Prepare the patient (Explain and demonstrate):	
a. Explain procedure b. Position the patient	
	c, Allow time to recover from any recent exercise or excitement.
3. Count the pulse (Explain and Demonstrate)	a. Always wash hands before the procedure.
b. Place first three fingers over thumb side of patient's wrist; then press lightly over the radial artery.	c. Do not use your thumb; you will feel your own pulse in your thumb.
d. Count the pulse for one minute.	
e. As you count, rote the force and rhythm.	
4. Record the pulse rate and any observations.	a. Record on Nurse's Notes and Graphic Sheet when taken with the temperature.
	b. Record any irregularities in Nurse's Notes.

III. APPLICATION

A. Divide the class into pairs. One in each pair will assume role of "patient"; the other will assume the role of "nurse." Have each "nurse" measure, describe and record the "patient's" pulse. Direct each "nurse" to practice the procedure several times as necessary.

B. Direct each pair to reverse roles and practice the same procedures.

IV. TEST

A. Divide the class into different teams. Have each measure and record the pulse two times.

B. The two recordings made by the same "nurse" on the same "patient" should agree to within plus or minus 4 counts. If not, have the procedure repeated until standard is reached.

V. ASSIGNMENTS

Direct students to study the chapter in text on measuring blood pressure.

EXAMPLE 7

FILL OUT CASH REGISTER SUMMARY SHEET

This Distributive Education lesson plan for a cashier-checker task is similar in most aspects to previous examples. The main components in the plan are the introduction, lesson development, student application, performance evaluation, and lesson summary. The plan is self-explanatory and needs no further description.

NOTE: Many Alabama Distributive Education teachers use the learning activity packages in a self-paced, individualized system. Those teachers will not have a lesson plan. Instead, they will have an instructor guide specially prepared for the individualized packages.

TASK: Fill out cash register summary sheet

PERFORMANCE OBJECTIVE:

Provided a cash register and a summary sheet, close out the register by filling out all of the necessary information on the summary sheet.

MATERIALS/EQUIPMENT:

1. Cash registers containing simulated bills, coins, checks and paid-outs.
2. Adding machines or calculators
3. Cash register summary sheets
4. Transparencies
5. Assignment sheets

INTRODUCTION

1. Explain importance of closing out cash register and filling out the cash register summary sheet.

2. Explain that lesson will include:

   a. Explanation and demonstration of the procedure.
   b. Practice in filling out the cash register summary sheet.
   c. Evaluated performance.

LESSON DEVELOPMENT

1. Using transparency, explain the entries on the cash register summary sheet.

2. Using the transparency of a filled-out summary sheet, explain how to accomplish the following:

   a. Record store number.
   b. Record date and time register is closed out.
   c. Record employee number or initial.
   d. Record register number.
   e. Record cash register drawer number.
   f. Record cash register drawer reading.
   g. Record actual count in drawer.
   h. Record total amount of bills.
   i. Record total amount of coins.
   j. Record total amount of checks.
   k. Record total amount of paid-outs.
   l. Calculate a subtotal.
   m. Record actual count.
   n. Record shortage or overage.
   o. Sign the form.
   p. Obtain authorized approval.

STUDENT APPLICATION

1. Give each student the assignment sheet and three cash register summary sheets.

2. Direct each student to use the date on the assignment sheet to fill out each of the summary sheets.

3. Correct any errors and clear up any misconceptions.

PERFORMANCE EVALUATION

1. Assign each student to a cash register in which the contents have been simulated.

2. Direct each to close out the register and complete the cash register summary sheet.

3. Evaluate each completed sheet to verify accurate counting, correct entries on summary sheet and accurate calculations.

LESSON SUMMARY

1. Re-emphasize any points or procedures with which student experienced problems or difficulties.

2. Re-emphasize importance of accuracy in closing out cash register and filling out the summary sheet.